



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/589,376

08/14/2006

Hideyuki Miyake

CU-5009 BWH

6031

26530 7590 06/25/2008

LADAS & PARRY LLP
224 SOUTH MICHIGAN AVENUE
SUITE 1600
CHICAGO, IL 60604

EXAMINER

KOSAR, AARON J

ART UNIT

PAPER NUMBER

1651

MAIL DATE

DELIVERY MODE

06/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,376	Applicant(s) MIYAKE ET AL.	
	Examiner AARON J. KOSAR	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/10/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 7-14 are pending and have been examined on their merits.

Information Disclosure Statement (IDS)

The information disclosure statement (IDS) submitted on October 10, 2006 has been considered by the Examiner; however, the IDS contains references that are in a foreign language.

The relevant portions of 37 CFR § 1.98 (a) and (b) state:

- (a) *Any information disclosure statement filed under § 1.97 shall include the items listed in paragraphs (a)(1), (a)(2) and (a)(3) of this section...*
- (2) *A legible copy of:*
- (i) *Each foreign patent;*
 - (ii) *Each publication or that portion which caused it to be listed, other than U.S. patents and U.S. patent application publications unless required by the Office;*
 - (iv) *All other information or that portion which caused it to be listed.*
- (3)(i) *A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from applicant's specification or incorporated therein.*
- (ii) *A copy of the translation if a written English-language translation of a non-English-language document, or portion thereof, is within the possession, custody, or control of, or is readily available to any individual designated in § 1.56(c).*
- (b)(4) *Each foreign patent or published foreign patent application listed in an information disclosure statement must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application.*
- (5) *Each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication.*

Accordingly, the references have been considered to the extent presented in the English language; as presented and accompanied by reference document which is an English language equivalent or translation, to the extent cited in the instant Application's disclosure, or as cited by the Examiner in a PTO-892. References which have been considered have been initialed. References which have not been considered have been lined through.

In the instant case the reference of SPARGO has not been provided; however, for the sake of compact prosecution, the Examiner has provided the reference and listed it on a PTO-892.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are indefinite because the phrase “boundary..is formed in a pattern with concavoconvex” is unclear. The phrase is unclear, because the structural cooperative relationship between the boundary and the elements comprising the boundary is unclear. It is unclear is the boundary is a positive boundary (e.g. an island) or a negative boundary (e.g. a well). Furthermore the term “with concavoconvex” is unclear whether the term refers to “a concavoconvex pattern”, to a pattern with a concavoconvex entity/object, or to another concavoconvex entity. Each interpretation is a reasonable interpretation of the claim; however, each embraces distinct subject matter, such that one would not be apprised as to the metes and bounds of the claims thereby rendering the claims indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by SINGHVI (US 6,368,838 B1) or SPARGO (U:PTO:892 - Spargo, B.J. "Spatially Controlled Adhesion, Spreading, and Differentiation of Endothelial cells on Self-assembled Molecular Monolayers", PNAS. 1994, 91(23), 11070-11074.) or KOICHI (PTO-1449: JP 2003-009870).

The claims are generally drawn to a substrate comprising a base material, and a cell adhesion portion, and a cell auxiliary portion inhibiting cell adhesion.

SINGVHI teaches a substrate comprising a baseplate or substrate and a plurality of cytophilic/biophilic islands isolated by cytophobic/biophilic regions (e.g abstract; figure 1). Singhvi also teaches an array grid formed from a linear template, including an electron microscopy grid or parallel lines (column 22, examples 1 and 3).

SPARGO teaches a glass substrate having a linear, alternating domain deposition pattern and the use of photolithography to provide a substrate for differential adherence and growth of cells. Spargo also teaches culturing of endothelial cells, including human umbilical vein endothelial (HUVE) cells (e.g. ¶2, page 11071, right column; figure 3).

KOICHI teaches a compartmentalized or fine-structure substrate comprising cell-adhesive and cell-non-adhesive areas based on hydrophobicity/hydrophilicity of graft layers comprising the substrate composition (English abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names **joint inventors**. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 1651

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 7-14 are rejected as anticipated by SINGHVI (US 6,368,838 B1), as applied under 35 U.S.C. 102(b) *supra*, or, in the alternative, under 35 U.S.C. 103(a) as obvious over SINGHVI (US 6,368,838 B1).

The claims are as above. Additionally, the claims are drawn to a patterned substrate, having, and inter/intra concave:convex distances of 0.5-30 micrometers.

While SINGHVI, as presented above, teaches a substrate, To the extent that Singhvi may be silent with respect to a particular shape, dimension, or pattern of the cell-binding and cell-nonbinding regions, it would have been obvious to provide a substrate having the instantly claimed features. It would have been obvious to have provided a plate/substrate having 0.5-30 micrometer distances, concavoconvex shapes, and/or linear arrangements, because Singhvi teaches manipulations of the morphology of the patterned plate. One would have been motivate to modify the plate in the manner of the instant claims, because Singhvi teaches configurations and methods of modifying the configurations, including: (1) adjusting to vary the island size relative to the desired cell dimensions, including teaching of 20 micrometer white blood cells and 1 micrometer *Xenopus* oocytes (column 12, ¶3-4); (2) adjusting an island area or shape, including “any size or shape, including rectilinear, circular, ovoid, and arbitrary shapes” (column 11, ¶ 3); and arranging in [linear] arrays, including grids wherein “irrespective of the shape of the islands, a pattern consisting of an array of islands is referred to as a grid” or parallel lines (column 11, ¶ 3-4; figure 1). One would have had a reasonable expectation of success in making the composition as claimed, because the alteration of a micro array for cell adhesion and the

Art Unit: 1651

modes of manipulation thereof are taught by Singhvi and the selection and optimization of a particular arrangement would be well within the purview of the skilled artisan.

Additionally, Singhvi is relied upon for the reasons discussed above. If not expressly taught by Singhvi, based upon the overall beneficial teaching and methods provided by this reference with respect shapes, sizes, and arrangements of the islands in the manner disclosed therein, including the teachings of using shapes with curvature (concave or convex, e.g. patterning with circular and ovoid shapes) and providing instruction on tailoring islands and spacer regions to a cell morphology, the selection of a particular shape and arrangement of islands and spacer regions is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35 USC 103(a).

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON J. KOSAR whose telephone number is (571)270-3054. The examiner can normally be reached on Monday-Thursday, 7:30AM-5:00PM, ALT. Friday,EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron J Kosar/
Examiner, Art Unit 1651

/Sandra Saucier/
Primary Examiner, Art Unit 1651